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The Aemodogryllinae (Orthoptera: Rhaphidophoridae) found in the Korean Peninsula.

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Abstract Five species of Aemodogryllinae are recognized from the Korean Peninsula; *Diestrammena unicolor unicolor* Brunner-Watt, *Paratachycines ussuriensis* Storozhenko, *Tachycines boldyrevi* Uvarov, *T. coreanus* Yamasaki and *T. asynamorus* Adelung. Of them, *P. ussuriensis, T. boldyrevi*, and *T. asynamorus* are reported for the first time from the Republic of Korea. Morphological variations of *D. unicolor unicolor* and *T. coreanus* are discussed and described. Illustrations of the male genitalia of all species are given.

Key words Orthoptera, Rhaphidophoridae, Aemodogryllinae, faunistics, morphological variation, Korea.

INTRODUCTION

The subfamily Aemodogryllinae (Camel crickets, Cave-crickets) consists of 54 species belonging to 7 genera distributed mainly in East and South Asia. They are nocturnal and commonly living in forests. During day-time they usually rest in caves, under stones, in holes of the soil, and on trees. Often they can be found in colonies having dozens of individuals, as it was observed in case of *Diestrammena unicolor unicolor* and *Tachycines coreanus* in the Korean peninsula. *T. asynamorus*, which is probably indigenous in East Asia, is also found in the green hothouses in Europe and North America. The systematic arrangement of the species by Storozhenko (1990) is generally followed in this article with few notes on the generic and subgeneric status needed to be revised. This is mainly due to the fact that some morphological characters used for separating genera and subgenera seem to be very variable, especially in case of the number of spines on the lower margin of hind femora (see following tables presenting variation of the armature on legs in *D. unicolor* unicolor and *T. coreanus*). This work was carried out mainly based on the collection of the Institute of Systematics and Evolution of Animals, which were collected previously in North Korea (DPRK) by author and other colleague since 1990, and some additional materials from other depositories as followings:

ISEA - Institute of Systematics and Evolution of Animals, Krak w, Poland.
CIS - Center for Insect Systematics, Kangwon National University, Chuncheon, Korea.
MNH - Museum of Natural History, Budapest, Hungary.

ZI - Zoological Institute, Warszawa, Poland.

Collecting localities:

Northern part of the Korean peninsula (DPRK)

Hyangsan, Mt. Myohyang-san ..... 40° 02′ /126° 12′
(Hyangam-ri, Hapiro Valley, Manpok Valley, Sangwon Valley, Sangwonam)
Vonsan (= Weonsan) ..... 39° 10′ /127° 26′
Onyong-ri, ... 38° 41′ /128° 12′
Samilpo-ri, ... 38° 41′ /128° 18′
Tongchon-ri ..... 38° 57′ /127° 53′

Southern part of the Korean peninsula (ROK)

Mt. Sobaek-san, Kangwon Prov. ..... 37° 49′ /128° 34′
Palgong-san, Kangwon Prov. ..... 36° 02′ /128° 42′
Chugok-ri, near Chuncheon, Kangweon Prov. ..... 38° 01′ /127° 53′
Chuncheon, Kangweon Prov. ..... 37° 53′ /127° 44′
Seoul ..... 37° 59′ /126° 34′
Taegu, Kyungbug Prov. ..... 35° 52′ /128° 35′
Mt. Chiri-san, Kyungnam Prov. ..... 35° 20′ /127° 45′
Mt. Oknyeo-bong, Isl Geoje, Kyungnam Prov., ... 34° 53′ /127° 44′
Isl. Geomun-do, Kyungnam Prov. ..... 34° 03′ /127° 26′

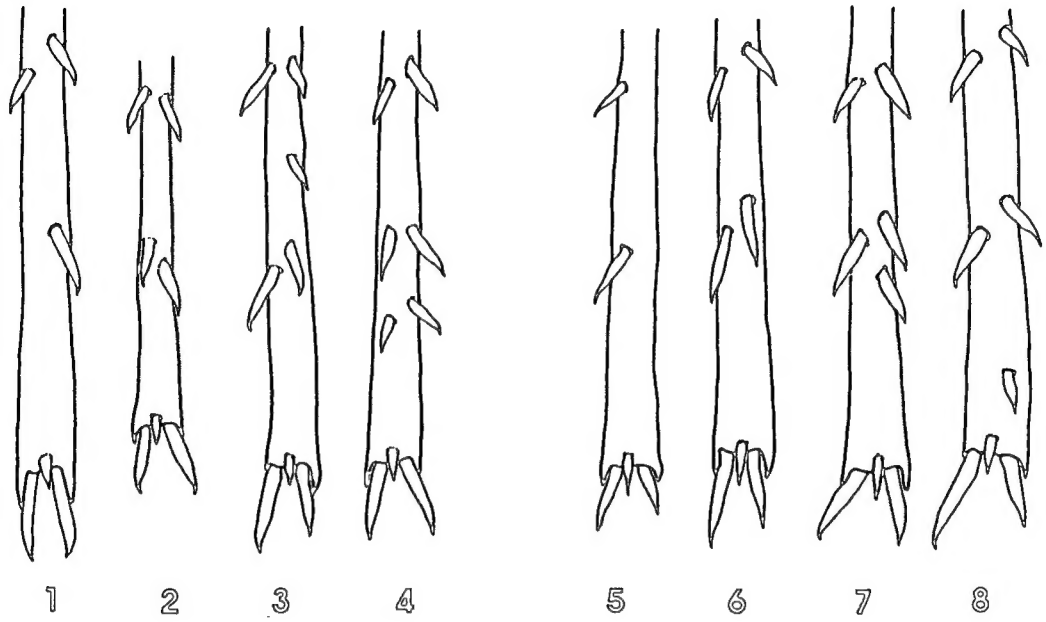
SYSTEMATIC ACCOUNTS

***Diestrammena unicolor unicolor* Brunner-Wattenwyl, 1888** (Figs 1-8, 9-15, 27)
Verh. zool.-bat. Ges. Wien, 38: 299.

Measurement (mm). body, ♂ 13.9-19, ♀ 14-20.1; pronotum ♂ 5.7-7.1, ♀ 6.3-8.2; hind femur ♂ 17-19.9, ♀ 17.5-21.9; ovipositor 10.1-14.2.

Materal examined. N. **Korea**—1♀, Mt. Myohyang-san, 8. VIII. 1959 (B. Pisarski, J. Prószyński; ZI); 2♀, Mt. Myohyang-san, Hyangam-ri; near Hyangsan, 23-24. IX. 1966 (C. Dziadosz, H. Szel giewicz; ZI); 1♂, Mt. Myohyang-san, Sangwonam, 25. VIII. 1990 (D. Kostia, E. Warchałowska & A. Nadachowska; ISEA); 2♂, 7♀, Mt. Myohyang-san, Hapiro Valley, 23-25. VIII. 1990 (D. Kostia, E. Warchałowska & A. Nadachowska; ISEA) ; 3♂, 4♀, Mt. Myohyang-san, Sangwon Valley, 500 m, 12. VIII. 1992 (D. Kostia, E. Warchałowska; ISEA); 4♂, 18♀, Mt. Myohyang-san, Hapiro Valley, 200-400 m, 9-10. VIII. 1992 (D. Kostia, E. Warchałowska; ISEA); 1♀, Mt. Myohyang-san, Manpok Valley, 500 m, 13. VIII. 1992 (D. Kostia, E. Warchałowska; ISEA); 3♀, Samilpo, 2. VIII. 1992 (D. Kostia, E. Warcha owska; ISEA); 1♂, Tongchon-ri, 3. VIII. 1992 (D. Kostia, E. Warchałowska; ISEA); S. **Korea**—1♂, Chugok-ri, near Chuncheon, 31. VII. 1986 (S. M. Lee; CIS) ; 1♀, Mt. Chiri-san, 14. VIII. 1986 (S. M. Lee; CIS) ; Isl. Geoje-do, Mt. Oknyeo-bong, 16. VIII. 1986 (S. M. Lee; CIS) ;

Distribution. East Russia (Primorsky Krai), North-East China, Korea (North and South) (Storozhenko,



Figs 1-8. Lower side of fore and middle tibia of *Diestrammena unicolor unicolor*. 1-4, fore tibia; 5-8, middle tibia.

1990).

Karyology. 2n ♂ =29 (XO) (Warchałowska-Śliwa et al., 1993).

Variation. There is quite remarkable variation in the armature of legs, as showned in the table 1 and figs 1-8.

Table 1. Morphological variation in the armature of legs in *Diestrammena unicolor unicolor*.

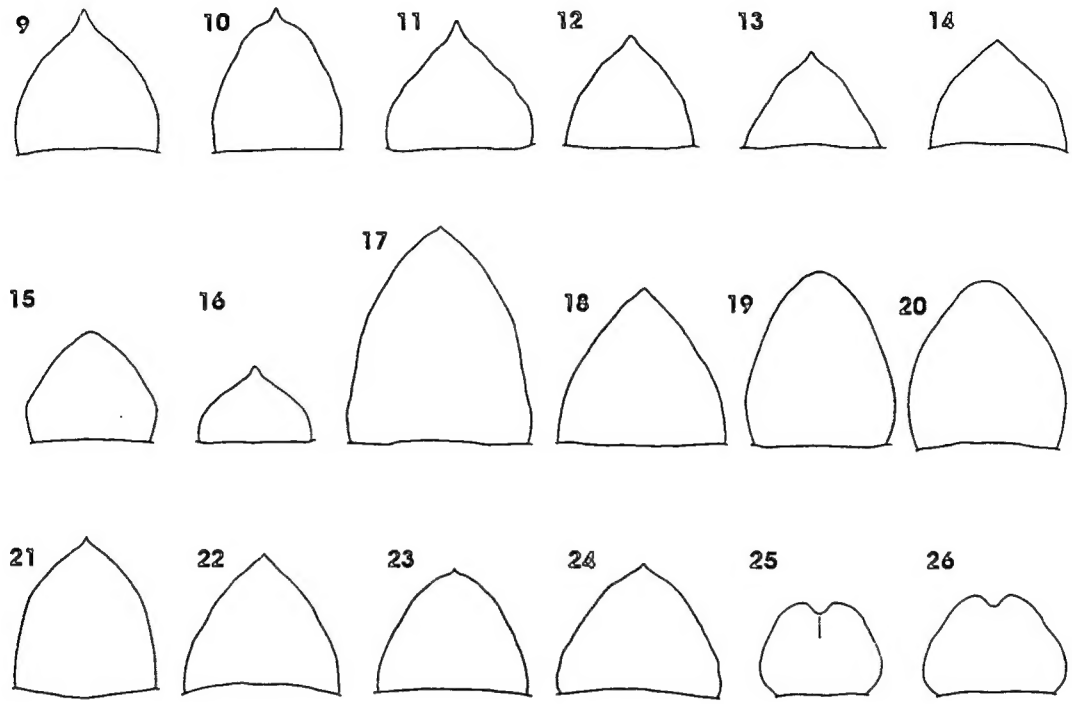
Character	Range	Maximum difference between left and right leg in the same specimen
Number of teeth on lower margin of fore femur	0~3	3
Number of spines on lower margin of fore tibia	3~6	2
Number of spines on lower margin of middle tibia	2~5	2
Number of teeth on lower margin of hind femur	5~13	4
Number of teeth on upper side of hind tibia:		
external	18~28	3
internal	18~29	5

***Paratachycines (Paratachycines) ussuriensis* Storozhenko, 1990** (Figs 16, 28)

Ent. obozr. 69: 844, figs 30-36 (Type: male, Russia, Primorski Kraj)

Measurement (mm). body, ♂ 12.2-13.5, ♀ 12.6-14; pronotum ♂ 4.7-5.3, ♀ 5.1-5.3; hind femur ♂ 12.6, ♀ 13.6-15.7; ovipositor 8.1-9.7.

Material examined. N. Korea—2♂, 3♀, Onyong-ri, near Hotel 'Kosong', 250 m, Kangweon Prov., 5-8. VIII. 1975 (J. Papp, A. Vojnits; MNH); S. Korea—1♀, Chuncheon, Kangweon Prov., 15.



Figs 9-26. Female subgenital plate. 9-15, *Diestrammena unicolor unicolor*; 16, *Paratachycines ussuriensis*; 17 20, *P. boldyrevi*; 21-24, *Tachycines coreanus*; 25-26, *T. asynamorus*.

X. 1984 (K. T. Park; CIS); 1 ♂, ditto, 12. VI. 1994 (S. J. Yeon & S. J. Hong; CIS)

Distribution. East Russia (Primorsky Krai), Korea (North and South) (Storozhenko, 1990)

***Paratachycines (Hemitachycines) boldyrevi* (Uvarov, 1926)** (Figs 17-20, 29)

Ann. Mag. Nat. Hist. (9) 17: 284 (Type: female, Russia, Vladivostok)

Measurement (mm). body, ♂ 15.5-18.7, ♀ 16.8-20.1; pronotum ♂ 5.3-5.4, ♀ 5.4-6.9; hind femur ♂ 19.1-20.6, ♀ 19-25.9; ovipositor 11.8-17.1

Material examined. N. Korea-North Pyongan Prov: 1 ♂, Mt. Myohyang-san, Sangwon Valley, 500 m, 12. VIII. 1992 (D. Kostia, E. Warchałowska; ISEA) ; 1 ♂, 3 ♀, Mt. Myohyang-san, Sangwon Valley, 400m, 25-28. VIII. 1990 (D. Kostia, E. Warchałowska; ISEA) ; 1 ♀, Mt. Myohyang-san, Hapiro Valley, 200-400 m, 9-10. VIII. 1992 (D. Kostia, E. Warchałowska; ISEA) ; 2 ♀, 6 larvae (4 ♂, 3 ♀), Mt. Myohyang-san, Sangwonam, 25. VIII. 1990 (D. Kostia, E. Warcha owska & A. Nadachowska; ISEA).

Distribution. East Russia (Khabarovsk Region, Primorsky Krai), Korea (North) (Storozhenko, 1990).

Karyology. 2n ♂ =47 (XO) (Warchałowska-Śliwa et al., 1993).

***Tachycines (Tachycines) asynamorus* Adelung, 1902** (Figs 25-26, 31)

Ezheg. Zool. Mus. AN, 7: 59, pl. 58, figs a-b. (Type: unknown, Russia, St. Petersburg, Botanical garden)

Measurement (mm). body, ♂ 14.1, ♀ 12.7-13.3; pronotum ♂ 5.1-5.4, ♀ 5.4-6.1; hind femur ♂ 15.7-16.8, ♀ 16.1; ovipositor 9.9-12.1.

Material examined. **S. Korea**—1♀, Chuncheon, Kangweon Prov., 7. VIII. 1984 (CIS); 1♂, 1♀, 15. X. 1984 (K. T. Park; CIS); 1♀, ditto, 24. X. 1984 (H. M. W.; CIS) ; 1♂, ditto, 30. X. 1984 (J. H. Ju; CIS) ; 1♀, ditto, 12. XI. 1984 (G. M. Kim; CIS) ; 2♀, Seoul, 2-3. VIII. 1988 (S. M. Lee; CIS).

Distribution. Europe, North America, Russia, Central China (from Bejing to Sichuan Prov.), Korea (South), Japan (Honsiu Is.) (Storozhenko, 1990).

***Tachycines (Tachycines) coreanus* Yamasaki, 1969** (Figs 21-24, 30)

Bull. Nat. Sci. Mus. Tokyo, 12: 616, figs 1-2 (Type: male, South Korea)

Tachycines (Tachycines) meditations Würmli, 1973. Mitt. ent. Ges. Basel N. F., 23: 1, figs 1-10 (Type: male, China)

Measurement. (mm). body, ♂ 18.6-20.8, ♀ 17.3-20.8; pronotum ♂ 6.6-7.6, ♀ 5.8-7.3; hind femur ♂ 19-22.3, ♀ 22.6-24.5; ovipositor 13.9-14.8.

Material examined. **N. Korea**—1♀, Vonsan (= Weonsan), 4. IX. 1966 (C. Dziadosz, H. Szel giewicz; ZI). **S. Korea**—1♀, Seoul, 3. VIII. 1988 (S. M. Lee; CIS); 16♂, 8♀, Tonghwa-sa Temple, Mt. Palgong-san, near Taegu, 8-10. VIII. 1995 (D. Kostia; ISEA); 1♂, Taegu, 9. VIII. 1995 (D. Kostia; ISEA); 1♂, Isl. Geoje-do, Mt. Oknyeo-bong, 16. VIII. 1986 (S. M. Lee; CIS); 1♀, Isl. Geomun-do, 9. VIII. 1986 (S. M. Lee; CIS).

Distribution. East China, Korea(South, North), Japan (Honsiu Is.) (Storozhenko, 1990).

Variation. There is quite remarkable variation in the armature of legs as shown in table 2.

Table 2. Morphological variation in the armature of legs in *Tachycines coreanus*.

Character	Range	Maximum difference between left and right leg in the same specimen
Number of teeth on lower margin of fore femur	5~25	9
Number of spines on lower margin of fore tibia	2~5	1
Number of spines on lower margin of middle tibia	2~3	1
Number of teeth on lower margin of hind femur	1~8	4
Number of teeth on upper side of hind tibia:		
external	41~68	8
internal	41~65	7

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REFERENCES

Storozhenko S. Yu., 1990. Review of the orthopteran subfamily Aemodogryllinae (Orthoptera: Rhaphidophoridae). *Ent. obozr.* 64(4): 835-849. (in Russian).

Warchałowska-Śliwa E., Maryańska-Nadachowska A., Kostia D., 1993. *Chromosomes of Diestrammena unicolor unicolor* Brunner von Wattenwyl, 1888 and *Paratachycines (Hemitachycines) boldyrevi* (Uvarov, 1926) (Orthoptera, Rhaphidophoridae, Aemodogryllinae). Karyotypes, C-bands and NORs. *Folia biol.*, Kraków 41(3-4): 77-82. (in Polish).

The Entomological Society of Korea and the Korean and the Korea Society of Applied Entomology, 1994. *Chect List of Insects for Korea* pp.364-382. (in Korean).

한국產 꼽등이류의 분류학적 정리

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꼽등이科의 Aemodogryllinae亞科 5種이 한반도產으로 정리되었으며, 그 중 *Paratachycines ussuriensis* Storozhenko, *Tachycines asynamorus* Adelung은 우리나라 未記錄種이었다. *Diestrammena unicolor unicolor* Brunner-Watt와 *Tachycines coreanus* Yamasaki 2種에 대한 형태학적 변이가 관찰·조사되었다.

검색어 : 분류, 메뚜기目, 꼽등이科, 한국

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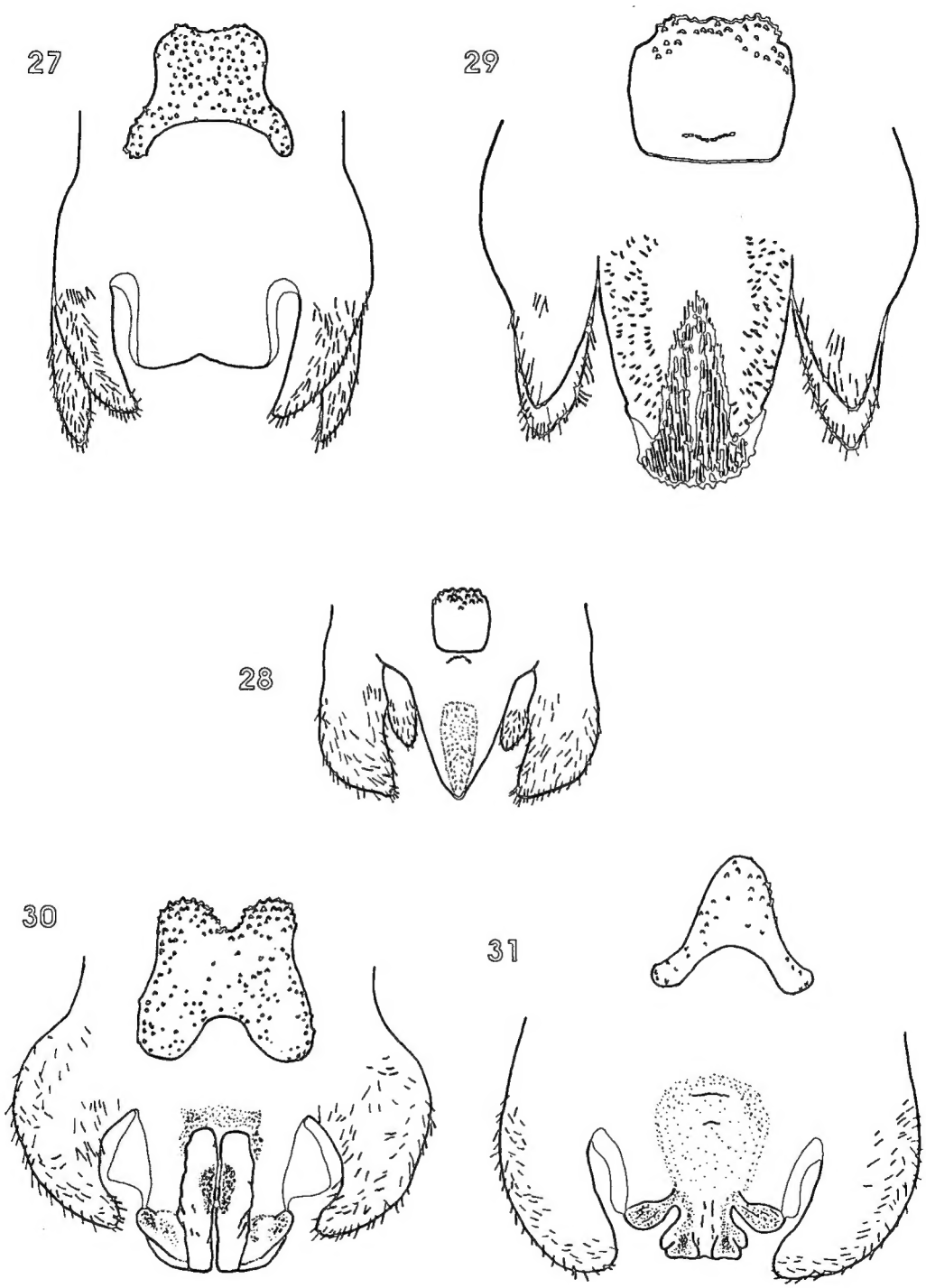

Figs 27-31. Male genitalia (dorsal view). 27, *Diestrammena unicolor unicolor*; 28, *Paratachycines (Paratachycines) ussuriensis*; 29, *P. (Hemitachycines) boldyrevi*; 30, *Tachycines coreanus*; 31, *T. asynamorus*.